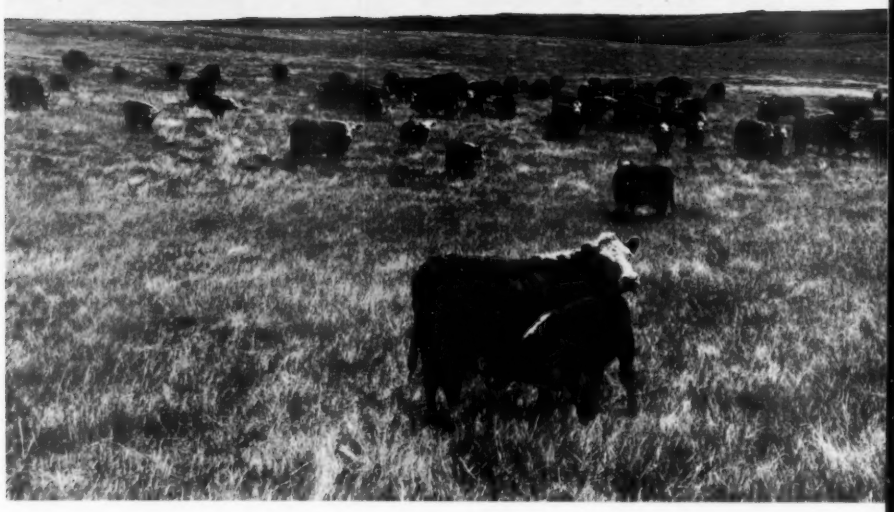
35/6 January 1970

Soil Conservation

Devoted to the wise use of land and water resources

Grassland conservation, livestock, and wildlife

SCS activities 1969



Soil Conservation Service
U.S. Department of Agriculture

Ecology...

Now that ecology is the byword of conservationists, both practicing and professed, SCS range scientists find themselves veterans amongst a company of newcomers.

The example (p. 123) reported by Texas Rangeman Rudy Pederson and Biologist James Henson illustrates how SCS's practicing ecologists have helped ranchers understand the complex life systems of brushy ranges and fashion programs of multiple use that produce both native wildlife and domestic livestock.

Idaho Conservationists Neal Bue and John Davis give us another example (p. 128) in an arrangement between a sheep ranch and the state game department to improve the range while accommodating a growing winter elk herd.

And economics

Grazing associations in many places have enabled ranchers to combine sound economics with efficient grass management to create profitable operating units, often under difficult circumstances. Fieldmen from Montana (p. 127) and North Dakota (p. 129) report on two pioneering examples.

Human environment

Ecology and economics are joined in the increasing emphasis by SCS on improving the quality of human environment by means of authorized soil and water conservation programs. Our annual summary of activities (p. 135) reflects a growing involvement during fiscal 1969 with community and regional land use planning and economic development through the use of land-resource data.

COVER: Good cattle on good grass are a delight to the ranchman's eye and a testimony to good range management in the Elk Creek Soil Conservation District, S. Dak.

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Prepared in the Division of Information, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250

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Managing rangeland for wildlife and livestock

By Rudy J. Pederson and James Henson
Range conservationist and biologist, SCS, San Angelo, Tex.

Sound range management benefits landowners, hunters, and more than 3 million whitetailed deer in Texas. The promise of extra income encourages many ranchmen to provide for deer as well as for domestic stock. Wild turkeys, quail, and other wildlife also thrive in the improved habitat.

Rangelands are the primary source of forage for livestock and big game on approximately 60 million acres in Texas. Although deer and other native wildlife belong to the state, they graze on privately owned lands.

Most ranchers realize that each day an adult deer consumes about as much forage as a sheep or goat (about 4 pounds). The 3.2 million deer in Texas remove more than 12 million pounds of forage daily—forage that could otherwise be utilized by cattle, sheep, or goats. With this in mind, landowners turn deer to economic value by offering hunting leases for sale.

Multiple use of rangeland for livestock and game production has become big business. By charging for the privilege of hunting on their lands, ranchers capitalize on forage consumed by wildlife. Gross income from hunting leases in Texas is estimated to be more than $17 million annually. In 1968 approximately 33 million acres was leased for deer hunting, and 280,000 deer were harvested.

Conservation plans developed and applied by landowners with help from the Soil Conservation Service include grazing management and conservation measures to (1) improve range for livestock and (2) enhance wildlife and recreational resources. Management decisions are based on analysis of costs and returns of alternative approaches in relation to the available range and wildlife resources in each case.

Deciding on the number of grazing animals to be stocked is one of the operator's most important tasks each year. It is essential that livestock and deer populations be balanced with available forage.

In years of low forage yield, ranchers can cull breeding herds, sell calves and lambs early, and otherwise vary livestock numbers to adjust the grazing load on ranges.

Deer are not so easy to manage. Starvation during drought some-

Deer and wild turkey thrive where good range management is practiced in the Texas brush country.

Too many deer, sheep, and goats in the same pasture strip all foliage from oak brush as high as the animals can reach and lay the soil bare to erosion.

times reduces deer numbers more than desired. Conversely, when food is abundant and other environmental factors are favorable, herds may increase as much as 50 percent in a year. Normal increase of most Texas deer herds is in the range of 15 to 40 percent.

Research shows that about 25 percent of a healthy deer herd should be harvested annually. Unless hunting is concentrated on the annual population increase, the reward for good management may be forfeited. Deer cannot be stockpiled; any excess over carrying capacity will be lost to starvation, disease, or natural predators.

A sound hunting enterprise that accounts for the annual increase helps to reduce peaks in the "boom and bust" cycle. This means more forage for each deer; better reproduction; and larger, healthier, trophy-type deer. The average hunter, however, is often reluctant to take antlerless deer as part of his quota. The type of hunting lease thus becomes an important part of range management programs designed to balance forage and consumption.

A unique leasing arrangement works well for Mr. and Mrs. Gilbert Anderegg, cooperators in the Upper Llanos Soil and Water Conservation District on the Edwards Plateau.

Rather than offer a conventional lease to one group of hunters for the entire season (usually about 47 days), the Andereggs allow each of three different groups to hunt deer and turkey for about 2 weeks. Between each period, the ranch is not hunted for several days while the game "settles down" to normal routine.

"We took in $3 an acre from hunting leases last year on our ranch," the Andereggs reported. "This type of leasing arrangement not only produces additional income but also allows the harvesting of more deer and turkey."

Kinds of livestock

When deer are desired, correct livestock selection is important. Deer preferences for long, narrow pastures stocked at varying rates with different kinds and combinations of livestock have been observed for many years by Leo Merrill, superintendent of the Sonora Experiment Station Ranch. He notes that:

(1) Deer are rarely seen on pastures that are continuously and heavily stocked with sheep, goats, and cattle, or where sheep are moderately or heavily stocked.

(2) There are few deer in pastures stocked heavily with goats only.

(3) Deer are most abundant and consistently seen in pastures with (a) no livestock; (b) light stocking; (c) goats moderately stocked; (d) cattle only; (e) cattle, sheep, and goats grazed in a four-pasture rotation deferred system.

Livestock compete with deer for forage if the range is heavily grazed. Competition sets in early and is more severe where sheep and goats are grazed. Deer may not survive because they are unable to alter their diet of forbs, browse, tender grass, and mast. Livestock can utilize lower quality dry roughage.

Brush management

Like many other deer managers, the Andereggs improve hunters' chances by removing excess brush and creating openings. Thousands of brush-infested acres throughout the state have been treated mechanically or chemically to control woody plants and restore grass and forb production. Landowners who control brush plan these measures to retain or improve deer habitat.

Although deer use open grasslands and cleared areas, they seldom stray far from the protective cover of standing brush. Factors such as topography and kinds and density of brush must be considered while determining the amount of woody cover necessary to sustain deer without hindering hunters.

In general, high populations can be maintained under hunting pressure when 25 to 35 percent of the land is left in brush. This cover must be properly distributed. For example, Anderegg alternates strips and blocks of controlled brush with uncleared areas. He also leaves brush along drainageways, on steep slopes, and on less productive soils.

Resting pastures benefits rangeland and means more forage for game animals in critical times. Deer are frequently seen moving into rested pastures. Hunting is easier when pastures are rested before and during the shooting season.

On the Anderegg ranch, sheep and cattle are grazed in rotation so that at least one-half of the range is being rested at any time. Anderegg sold his goats to permit better browse growth for deer. But that's a small sacrifice for the success of the couple's overall program.

"We're convinced that our multiple-use approach to range management has benefited wildlife as well as our grasslands and livestock," the Andereggs said. ♦

Pasture for profit

Indiana cattlemen spur effort to increase forage and beef production in Lincoln Hills

By Roy E. Hamilton and J. V. McDonald, Jr.
Conservation agronomists, SCS, Indianapolis, Ind., and Albuquerque, N. Mex. (formerly at Cannelton, Ind.)

Soil, grass, livestock, people—these are the ingredients.

Conservation, beauty, prosperity—these are the results.

A program to improve grassland and livestock in southern Indiana's Lincoln Hills Resource Conservation and Development Project is the means of bringing the ingredients together in a way to get effective results.

Farmers in the Lincoln Hills have long known that most of their soils have limitations for cropland use and cannot match Indiana's reputation as a Corn Belt state. Instead of broad, level farms, most of the area northward from the Ohio River through Harrison, Crawford, Perry, and Spencer counties is sharply rolling and broken only infrequently by productive bottom lands.

When the local sponsors, aided by agency specialists, were fashioning the RC&D proposals, one of the original working groups was a committee to help accelerate the region's forage and livestock development.

The goal of the 18-member group was to create more local income through intensive management of forage and livestock resources. Specifically, their objectives were:

—development of an intensified forage production and utilization program.

—development of livestock management and breeding practices to improve conversion of forage into income.

—development of high quality, standardized livestock.

—development of general interest in the Lincoln Hills livestock-forage program.

The Soil Conservation Service and the Extension Service helped farmers establish new pastures and improve old ones, and the Agricultural Conservation and Stabilization Service shared the cost through its regular ACP and special programs. In 1965 and 1966, the Office of Economic Opportunity paid the salary of an Extension Service forage-livestock specialist who assisted low-income farmers with livestock management, disease control, and performance testing. Since 1967 the Soil Conservation Service has provided a conservation agronomist to assist the sponsors of the Lincoln Hills Project.

Working examples

For years, Livestock and Forage Committee Chairman Bill Boldt's farming operation has exemplified good forage management, conservation, efficient livestock production, and sound breeding practices. His 455-acre Harrison County farm, overlooking scenic Blue River, has belonged to the Boldt family since the Civil War. With one-fourth of his farm in orchardgrass and ladino

Improved pastures, like William Freeman's farm near Tell City, Ind., mean improved cattle, improved income, and ultimately an improved Lincoln Hills.

clover, he markets feeder calves and pigs each year for top market prices —the best demonstration that good management produces good results.

Boldt's confidence in traditional forage varieties, such as orchardgrass, tall fescue, ladino, and medium redclover, hasn't kept him from searching for other improved varieties. He plans to overseed one fescue pasture to sericea lespedeza. He has seeded crownvetch in another small pasture and planted 4 acres for seed production. Elsewhere, he has established trial plantings of zigzag clover and common bermudagrass.

In Spencer County, Thomas Drury has 20 acres of common bermudagrass that was seeded many years ago by Southern field-hands who lived on the place. When Drury purchased the farm in 1950, he overseeded the bermuda with ladino clover and now stocks the pasture with a cow to the acre from June until frost.

Lincoln Hills farmers have planted several pastures to this grass, having discovered that it grows vigorously while some other cool-season grasses are nearly dormant. Bob Walton, a Crawford County dairyman, has a wet bottom-land field that has been in Reed canarygrass since 1945. He uses it for hay, haylage, and grazing. According to Walton, it responds well to nitrogen fertilizer and out-produces all other varieties in summer.

New techniques

Increasingly, Lincoln Hills livestock operators are taking advantage of surplus forage in the peak growing season by making hay, haylage, or by "haying" the standing grass later. Willis White and Floyd Allstott, Crawford County beef cattlemen, are among those who recently bought round hay balers to make their haying operations easier.

White says that by baling his fescue and leaving it in the fields, he reduces the labor of winter feeding and also makes hay available during summer droughts. Both White and Allstott plan to strip-graze fields with the round bales of fescue. With electric fencing, they enclose a month's grazing at one time and rotate the pasture by increments, thus reducing wastage of hay during the winter months.

Clarence Kaiser, Crawford County Livestock-Forage Committeeman, district supervisor, and registered Charolais breeder, has another outstanding example of sound forage management. His grassland conservation program has been studied and copied throughout the Lincoln Hills area. The two most important things in pasture management, Kaiser says, are to avoid grazing the grass too short, and to rotate livestock between pastures so that each pasture has a definite rest period between grazings. His farm is a virtual experiment station, now testing big trefoil, zigzag clover, crownvetch, bermudagrass, and six strains of alfalfa.

Valuable contributors

Adjacent to the Lincoln Hills area in Dubois County is the Southern Indiana Purdue Agricultural Center Forage Farm, which has given major assistance to farmers in improving their forage and livestock operations. The center was established in 1953, at farmers' request, to serve as a research station on hill-land fragipan soils. It recently held two field days for Lincoln Hills farmers which attracted large crowds.

After 5 years, the results of the RC&D effort are confirming the hopes of project organizers. For example, more than 28,000 acres of pasture has been established or renovated, including a large acreage converted from other uses. More than 10,000 acres of pasture was "properly managed" for the first time last year.

At the Spring Feeder Calf Sale, operated by Producers Marketing Association at Milltown, 625 calves were sold for $87,924.36. Beef cattle numbers increased 23 percent between 1967 and 1968.

The Livestock and Forage Committee is now undertaking three RC&D Project measures to obtain better marketing and production practices: (1) To determine interest in organizing a grazing association, (2) to inventory cow herd producers and determine the type of market they would support, and (3) to determine desire for more personal assistance in production and marketing. ♦

Soil mapped for planning Detroit expansion

Preparation of a general soil map of a seven-county area in southeastern Michigan was one of the first steps in a comprehensive regional plan for controlled development. Soil survey results were incorporated in intensive studies of transportation and land use around metropolitan Detroit, undertaken by the Southeast Michigan Council of Governments. Planners have laid out desirable expansion patterns designed to accommodate an additional 2 million people by 1990 without wasting open space or utilizing unsuitable soils. ♦

Colorado 21st state covered by updated programs

Colorado has become the 21st state in which all local soil and water conservation district programs have been updated to fit todays broad needs.

Assistant Secretary of Agriculture Thomas K. Cowden has signed a new memorandum of understanding with the Stonewall Soil Conservation District in Las Animas and Costilla counties on the basis of its new long-range program. The agreement with this district completes the updating of district programs in the state. ♦

Badlands grazing venture typifies success of grazing associations

By Walter Anderson, Dean Davidson, and Clayton Ogle
District conservationist, SCS, Sidney, Mont.; chief of community services, FHA, and state resource conservationist, SCS, Bozeman, Mont.

It's hard to believe even after 5 years, but 11 Montana farmers still say they bought a 28,000-acre ranch for $5 each.

There's more to the story, of course, but their venture is demonstrating how the growing number of ranching cooperative or grazing associations are opening up new opportunities for men whose only shortage is money.

Around Sidney, Mont., nature is harsh and difficult—extreme climatic variations in temperature and rainfall, rugged badlands, remote and undependable watering places for livestock, difficult roads, and limited communications. Even so, with proper handling this still-new land almost astride the North Dakota line can produce lush summer grass, handsome livestock gains, and prosperity in an otherwise distressed economy.

Natural hardships

For years, Karney Redman, owner of the 28,000-acre Smith Creek Ranch south of Sidney, observed the region's economic difficulties and shared its hardships. As an example of the range conditions he faced, only one-third of his grassland could be grazed because the remainder had no water and lay beyond the traveling distance of livestock. Rambling Smith Creek, three wells, and one dam supplied all stock water but frequently went dry during droughts.

Between the Yellowstone River, which borders the west end of the ranch, and its eastern boundary lies some 45 square miles of Montana's most rugged badlands, criss-crossed by deep canyons and coulees interlacing thousands of acres of high escarpments and scarcely-touched sod. Even with good grass, Montana badlands offer practically no hay harvest, minimal winter grazing, and nearly impossible travel for man and animal alike. Only one road, impassable much of winter and after rains, gave access to town and schools 28 miles away.

In 1963, Redman became a cooperator with the Richland County Soil and Water Conservation District and with the aid of Soil Conservation Service conservationists began an inventory of his Smith Creek range resources. They surveyed the ranch and discovered several natural springs, sites for wells and dams, waterspreading systems, natural barriers, and sites for cropland. They made estimates on the cost of the projected improvements, stocking rates before and after development, and other details involved in a complete conservation plan for the property. Redman signed a Great Plains Conservation Program contract and began making the scheduled improvements with cost-share assistance.

Meanwhile, Redman gathered neighboring farmers to form the first grazers association with a Montana Grazing District. The organization completed, the 11 members paid a membership fee of $5 each. Then the Farmers Home Administration approved their loan request for $265,000, and the group held title to Redman's 28,000-acre Smith Creek Ranch.

Between the 1963 application and 1964 approval notification, Redman pushed his Great Plains Program forward and installed about half the proposed watering places. The grazing association took charge only days before a violent rainstorm hit the ranch and washed out miles of hard-earned fences and four costly dams.

Immediately, the group set out to repair the damage. Today, the work is nearly completed. Three wells, seven dams, and one spring development have been completed. Two wells have been rebuilt, all fencing has been completed, and all old fences and washed-out dams have been repaired. The 250-acres of grass-seeded cropland is now a good native pasture.

A grassland management plan, reviewed annually by the directors, assures proper use of all the range. After 4 years, during the summer of 1969, livestock on Smith Creek Ranch had 40 percent more grazing than before improvement.

Investment figures

Tallying their figures, the ranchmen found the cost of work under the Smith Creek Ranch's Great Plains contract totaled $23,120. Great Plains Conservation Program funds cost-share $14,500 of this total. The rancher's share is $8,680. An additional $8,700 in Federal cost-share funds came from the Agricultural Stabilization and Conservation Service through its flood-restoration program.

Presently, each animal-unit-month of grazing costs the ranchers $3.58, including operation and maintenance of the ranch, interest, principal payments, and payment to a sinking fund. In 1968, income from grazing fees was $26,000. Operating expenses amounted to $8,950, not including interest and principal. To date, the group has paid $62,284 against interest and principal, paid off $10,415 of the principal, and accumulated a reserve fund of $6,444. All grazing fees are paid and no other indebtedness has been incurred.

Smith Creek Ranch? Now, it has good grazing, good water, and a good living for each owner. The grazing association concept has proved so successful, in fact, that

today 28 additional grazing associations have been organized in Montana and four more are being formed.

Others follow

On the State scorecard, more than 400 Montana ranchers have used USDA's loan, cost-share, and technical assistance to purchase, improve, and manage grazing land. They have bought or are buying some 322,000 acres of private ranchland and adding grazing permits on some 284,000 acres of federally owned land. Government agencies managing the federal land have already carried out extensive development programs and have assisted the associations with grazing management plans. FHA has loaned nearly $10 million to associations to purchase land capable of supporting 33,000 cattle annually during Montana's 6-month grazing season.

About $750,000 is programed for stock-water developments, range seeding, cropland conversion, fencing, and related conservation developments. Half of the development costs are scheduled for cost-sharing under the Great Plains and Agriculture Conservation programs. Association members are buying the land and are including development and operation costs for around $5 per animal-unit-month.

The additional summer grazing, coupled with winter feed bases on their home ranches, will enable the grazing association members to stay in business in the face of the ever-present cost-price squeeze. ♦

Private range and elk herd both gain in deal between ranchers and state

By Neal S. Bue and John Davis
District conservationist and range specialist, SCS, St. Anthony and Idaho Falls, Idaho

An exchange of grazing privileges and other cooperation between the Siddoway Sheep Company and the Idaho Fish and Game Commission helped halt range deterioration on the Siddoway ranch and doubled the safe size of an elk herd that wintered there.

Brothers Bill, Bud, and Denton Siddoway operate a 35,600-acre spread headquartered at St. Anthony, Idaho, where their grandfather, James Siddoway, homesteaded in the late 1880's. Bill is a national director of the National Wool Growers Association.

Range improvement

Cooperating with the Yellowstone Soil Conservation District, the Siddoway brothers in 1963 embarked on a program of range improvement including extensive control of big sagebrush and reseeding of grass.

A special problem was a sizable elk herd that wintered on some of the Siddoways' best early-grazing land. The brothers worked out an agreement with the Idaho Fish and Game Commission under which the commission helps pay the cost of seeding some of the depleted range in exchange for the use of the wintering area by the elk herd. The commission also permits the Siddoways to use some of the state's game range while the seedings are becoming established.

At the beginning of the cooperative effort, about 500 head of elk was considered the practical size for the herd. With additional land and improved forage, the herd has increased to more than 1,000 head. Range deterioration has been greatly reduced or eliminated.

Initially, about 235 acres of former cropland was seeded to crested wheatgrass and Ladak alfalfa. Encouraged by the success of this seeding, an additional 1,400 acres has been planted to various grasses, including intermediate wheatgrass, Whitmar wheatgrass, and Manchar bromegrass. Sainfoin and hairy vetch have also been planted instead of the alfalfa.

"This agreement was one of the best things that ever happened to us," says Bill. "It not only gives the elk a good wintering area, but it gives us about 10 days earlier grazing in the spring, so we all gain."

Landholder-Sportsman

The Siddoways were recognized for their efforts by the Idaho Landholder-Sportsman Council in 1965 when they were awarded the "Landholder-Sportsman of the Year" plaque in recognition of "Outstanding leadership and promotion of improved landholder-sportsman relations."

The sheep operation is based on a breeding herd of approximately 6,000 ewes with necessary replacement yearling ewes and rams. The range resources are comprised of five separate units of deeded and leased land. In addition, the operators hold grazing rights on Fremont County Woodgrowers' land and permits on adjacent land administered by the Bureau of Land Management. They also have permits for six bands of ewes and lambs for summer grazing on the Targhee National Forest south of Yellowstone National Park.

The Siddoways' operation also includes a 320-acre irrigated farm used mainly for production of winter feed. Additional hay and other winter forage, as required, are purchased locally or from other available sources.

The Siddoways work out exchanges with other landowners for adjoining tracts in order to "block up" the operating units and effect better control of livestock and grazing use. ♦

Agency, owner cooperation aids grazing association

By Robert W. Runner
Range conservationist, SCS, Bowman, N. Dak.

The first cooperative grazing association in North Dakota is finding the cooperation of USDA agency programs an effective aid to the cooperation of members in the successful operation of its grazing land.

The Horse Creek Cooperative Grazing Association, a cooperator with the Bowman-Slope Soil Conservation District, was formed in 1967 by ranchers from western North Dakota and eastern Montana.

Members arranged to purchase most of a Slope County ranch along the Little Missouri badlands with a Farmers Home Administration loan. It was the first such association financed by the FHA in the state.

During the time that negotiations for financing and purchasing the land were underway, the owners-to-be worked out a conservation plan with the assistance of Soil Conservation Service and Forest Service technicians. A Great Plains Conservation Program contract was signed soon after the land purchase was completed.

Public and private

Included in the total acreage now managed according to that plan are 9,000 acres of National Grassland administered by the Forest Service and 1,600 acres of school land administered by the North Dakota State Land Department.

Terms of the Great Plains contract provide for cost-sharing for grass seeding, pond construction, cross fencing, and well drilling on the private land. In addition, Forest Service provides cross-fencing and range reseeding on the National Grassland range. Several wells have been cost-shared by the ASCS Agricultural Conservation Program.

"We obtained this unit to provide additional summer grazing. We have to make the most efficient use of each acre if it's going to pay off," Association President F. E. Plummer said. "This means cross-fencing for more manageable pasture sizes, water development so we can use these pastures at any time during our grazing season, and other types in intensive management.

During their inspection tour in 1969 the group found that considerable progress had been made. Approximately 1,100 acres of cropland had been seeded to native grass, 15 stock-water ponds built, and seven wells drilled. Three cross-fences with a total length of about 8 miles had been built.

"In pastures that are now fenced and watered, we distributed grazing fairly well, but in the largest pasture that is not yet cross-fenced, we grazed some areas a little too heavily," Plummer reported.

Utilization check

At the site of a utilization cage set up by the Forest Service during the 1968 growing season, members could compare plant growth inside the cage with that in the grazed area. The difference in height indicated that the degree of use had reached about 70 percent. Utilization checks in other pastures showed use of less than 50 percent.

"When we have completed another 8 to 10 miles of cross-fencing and established grass on all land formerly cropped, then we can follow our planned grazing system," Association Secretary Faye Beach said. "We think this will greatly reduce our grazing distribution problems. Everything we've done so far has brought us close to uniform use and management of the pastures." ♦

Association officers, 4-H members, and representatives of federal agencies compare the height of grass grown in the protection of a "utilization cage" (which has been removed from spot in right foreground) with that of the surrounding grazed pasture.

Operating popular ski center . . .

New York farmers discover winter income

By Donald J. White and Homer E. Stennett
Resource development specialist, Cooperative Extension Service, and project coordinator, SCS, Albany (formerly Ellicottville) and Little Valley, N. Y.

More than 100 rural families in the southwestern corner of New York have discovered "gold" in their surrounding hills by transforming idle farmland into a skier's winter wonderland.

Until recently, French Creek villagers in Chautauqua County had tough sledding when up to 240 inches of snow covered their highland dairy farms, burying most of their jobs until the spring thaw. By most standards, the area itself was economically depressed, so rather than remain many residents chose to commute over hazardous roads to distant factories.

Then, in 1963, Phil Gravink, a French Creek native who graduated from Cornell's College of Agriculture and returned home to farm, set out with four neighboring businessmen to develop a ski center that they called Peek'n Peak. As a farmer, Gravink had long been a cooperator with the Chautauqua County Soil and Water Conservation District. When he commenced the ski venture, SCS and the district directors took an active interest and recommended conservation measures that would protect the steep slopes Not only did the vegetation halt erosion, but it also acted as insulation to keep a better snow base longer—122 days in 1967.

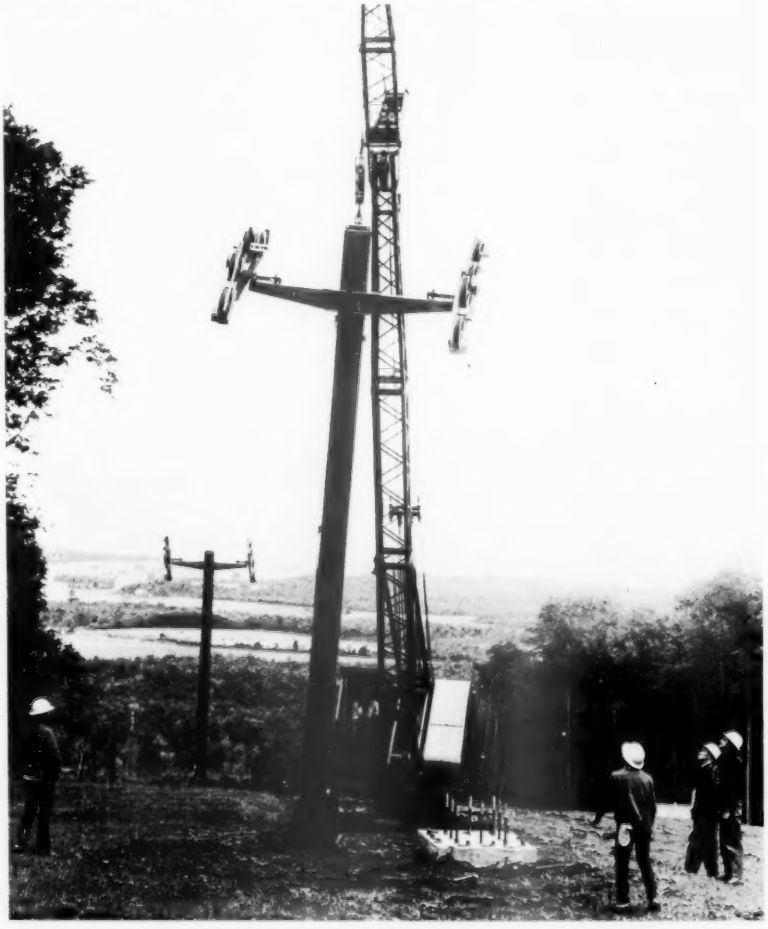
All of the money for development was raised locally—by 100 people who brought $160,000 worth of stock and a bank that loaned an equal amount. As the ski center entered its 1969 season—its fifth year of operation—continued growth has brought their investment to $700,000. New facilities include equipment that will lift 4,000 people an hour up the slopes.

Virtually all of the people needed to build and operate the development were hired locally, and demonstrated that their farming skills were well adapted to the new endeavor — clearing and seeding, constructing roads and buildings, operating equipment and materiel.

A typical example of locally produced talent being put to new use is Lester Marback, a part-time farmer and carpenter, who joined the ski center project in its infancy and remained to become a valuable member of the Peek'n Peak staff.

He and Superintendent George

Workmen at the Peek'n Peak Ski Center install T-bar ski-lifts that have altered the agricultural economy in southwestern New York.



Boozel and Business Manager Myrl Babcock are among the 130 people who keep the ski area operating. Altogether, there are 71 men and women on the operational and kitchen staff, 15 people in the ski shop concessions, 26 ski instructors, nine contractors who employ 18 people variously skilled as well-drillers, carpenters, electricians, and heavy equipment operators. Thirty-five are employed year-round.

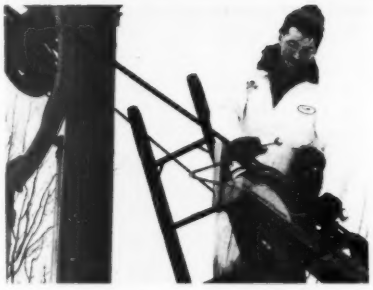
Indirect benefits

French Creek residents are feeling other indirect benefits from the ski center. Young people, like Duane Gabriel, who recently completed his military service and returned to French Creek, are finding good employment opportunities at home without moving into the cities. A local lumber company is adding employees and lumber stock to meet the increased business from the ski area and secondary developments. They are also using more locally produced lumber—mostly hemlock—and thus increasing the workforce in woodlots and sawmills.

Western New York produces large amounts of maple sirup and other maple products, which skiers are now buying in larger quantities. Restaurants which formerly operated only in summers are now open all year. Old farmhouses are being reopened and refurnished to house skiers, and summer cottages at neighboring Findley Lake are being winterized for all-year use.

Phil Gravink, project designer and original sponsor, oversees expansion.

Concessions provide tasty food for visitors and new income for residents.



George Boozel, machinery repairman, maintains ski-lift equipment.

Four motels, with 350 beds altogether, now enjoy capacity crowds throughout the winter, which formerly was their slow season. A trailer court has been expanded and a new campground has been established near the skiing area, while private buildings are buying attractive sites along the French Creek Valley.

Future plans?

Peek'n Peak's next planned development is the construction of vacation homes which will be built on the property under management supervision. Two chalets currently are going up, with five others ordered. Again, experienced local craftsmen are handling the construction work. The lots for the chalets are part of a farm purchased for $30 an acre and now being sold, after adding roads, water, and sewage systems, for $6,000 an acre.

Developers expect that the current second home construction will add $500,000 valuation to the town's tax rolls within a few years. In 1968, the company paid $5,000 in taxes on land that paid $250 in taxes 5 years earlier.

Phil Gravink, the operational manager of the ski center and director of the development project, is naturally pleased that the venture is paying off. Even more, he is pleased that the formerly depressed area around French Creek is making the most of its human and natural resources toward complete economic recovery.

People who come to ski, as well as local residents who host the visitors, are equally pleased to see the results of their efforts. ♦

A story of cool, clear water . . .

Plumbing on the plains

Cowhands of the old West sang about "cool, clear water." It was the subject of dreams along many a dusty trail. And it was the cause of a few shootings.

Ranchers in Sioux and Dawes counties, in the extreme northwestern corner of Nebraska, have about quit singing about it except at barbecues, and there have been no shootings lately. But there is "cool, clear water" now. It comes down out of the sandy ridges and travels many miles across the plains in a plastic pipe. It wasn't always so convenient.

A way of life

People have been hauling water on wagons or trucks since the country was settled in the 1890's. At times it was the only item scarcer than money. For many, water hauling had become a way of life, just like making hay or branding calves.

Nearly a million acres of good grazing land in the two counties is not being properly used because of lack of water. Areas of Pierre, Chadron, and Niobrara shales won't yield enough water for wells, yet the grass is lush. Another 180,000 acres of Brule siltstone derivatives yield a questionable amount of water of equally questionable quality. But grazing is good here, too.

Supervisors of the Sugarloaf and Scotts Bluff soil and water conservation districts, which make up the area, had been talking about pipelines for about 5 years when they took a trip over into Colorado to look at some. They came back convinced they would work in Nebraska.

Jess Locker, Harrison, was a pioneer and a prime mover of Antelope Pipeline, Inc., the first organization of its type to be certified under Nebraska law. Fresh water has been flowing through the Antelope Line since January 1967.

Formerly, Locker was hauling 250 gallons of water a trip in a tank on his pickup, and sometimes he had to make two trips a day to Harrison, 20 miles away. A tankful would serve the house for 12 days, if everyone was careful. Mrs. Locker kept her old-fashioned wringer-type washer because it used less water than a more modern one. They moved the cattle around in dry spells to make water hauling easier. Sometimes the water truck was busy all day.

A modernized household

Now the Lockers have a new automatic washer, a dishwasher, and five stock-watering tanks. The tanks are spotted over the ranch to serve the herds and distribute grazing to best advantage.

Antelope Pipeline is 22 miles long and serves eight ranchers. It cost about $50,000 to get a main line in. Each rancher pays for his own feeder lines and tanks. The Agricultural Stabilization and Conservation Service cost-shared 60 percent of mainline costs, or about $28,000. Users divided the rest of the cost among them. Jess Locker figures the line cost him about $2,500, but it was well worth it.

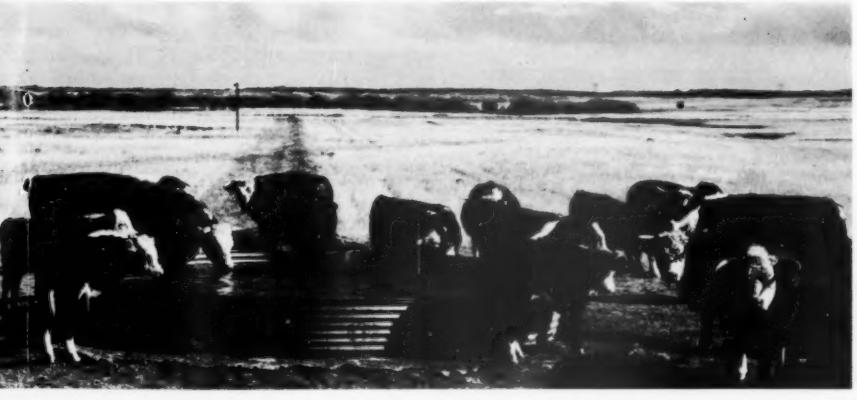
Users own the line. Each pays a nominal monthly charge to take care of the cost of pumping plus a little backlog for any possible maintenance costs. About $5 to $8 is average.

Getting organized

The first line was so successful that local leaders could see right away they were going to have to get organized if they met the demand. Supervisors of the two soil conservation districts contacted each rancher and got signed petitions for water in order to have demands in writing. The Extension agents sent questionnaires to the entire rural population to determine who had water and who needed it. The two ASCS committees asked for, and got, approval to extend cost-sharing to other pipelines. The Great Plains Conservation Program also cost-shares pipeline construction for participants who contract to install a complete conservation plan for their land.

And other pipelines have gone in. To date there are 245 miles of them

An old army wagon originally used to haul water to Ft. Robinson saw later service on a ranch. Below, Jess Locker has "retired" his water tank now that he is on a pipeline.



A contractor opens a 5-foot-deep trench across the plains and lays a 2-inch plastic pipe to bring water to members of Antelope Ditch, Inc. Cattle then gather around the watering tanks at the end of the line.

in the ground in the two counties. Surveys have been made for another 400 miles.

The Soil Conservation Service surveys and designs the lines and supervises the installation. ASCS committees and conservation district supervisors steer the forming of corporations. The rural electric cooperative puts in the first half mile of powerline free, then does the rest of the job at $1,800 per mile.

Each rancher gets 20 gallons a day per animal unit, plus 500 gallons a day for household use. Most of them had plumbing in the homes, once supplied by cistern or tanks, so the new water flows right in. Under the terms of the incorporation, livestock and household are the two legal uses for the water.

Until the advent of plastic pipe, these lines wouldn't work. The high salt content of the soil quickly destroyed any metel pipe buried in it.

The 160-pound test line is buried 5 feet deep to get below the freeze problem. Joints are glued. Long lines begin with a 3-inch size, step down to two, and lead off into 1-inch feeders. Contractor Ed Ehrhart, who has laid most of them, guarantees materials and workmanship for 20 years.

Wells up in the sandy ridges are of 8-inch bores. They go 50 to 250 feet deep, depending on the depth required to get 25 to 40 gallons a minute per well.

Water is the key to grazing management, which in turn is the key to range conservation. Water where it is needed keeps cattle moving about over the range, using the grass uniformly. Water at the right places let the rancher divide his range with fences so he can defer grazing where needed to let grasses recover.

One of the stories going the rounds of the Panhandle is of the rancher who subscribed to the pipeline and had plenty of fresh water in the house. But one day when he came in from work he went straight to the kitchen and emptied his canteen back into the pail. Old habits are hard to break. ♦

Meetings . . .

Grazing fees, taxes concern wool growers

The National Wool Growers Association will hold its annual convention in Denver, Colo., on January 21–24. The association is concerned with decreasing sheep numbers, imports, diseases, taxes, and public land grazing fees. Many of the wool growers are conservation district cooperators, and many also use public land for grazing. Their conservation programs often involve joint planning with the land-administering agencies.

Information fair to feature cooperatives' meeting

An information fair will display prize winning cooperative magazines, newspapers, newsletters, and other information materials at the 41st annual meeting of the National Council of Farmer Cooperatives January 13-14 in Hollywood, Fla. Among the topics to be featured in the discussions are "Alliances for Action," "Impact of Tax Law Changes on Co-op Growth," and "An All-Systems Approach to Cooperative Growth."

Cattlemen to discuss land recreation problems

The annual meeting of the American National Cattlemen's Association will take place in Washington, D.C., on January 25-28, with the Virginia and Maryland Cattlemen's Associations as hosts. Grazing fees on public lands, taxes, livestock marketing, landowner-recreationist problems, and other conservation issues are subjects for discussion.

Dates and places

January 13–14, 1970, National Council of Farmer Cooperatives, Hollywood Beach, Fla.

14–17, Garden Seed Conference, New Orleans, La.

21–24, National Wool Growers Association, Denver, Colo.

24–28, American National Cattlemen's Association, Washington, D. C.

26–30, American Society of Civil Engineers Water Resources Conference, Memphis, Tenn.

February

1–3, Sprinkler Irrigation Association, Denver, Colo.

1–5, National Association of Soil and Water Conservation Districts, San Francisco, Calif.

9–12, American Society of Range Management, Denver, Colo.

14–18, American Association of School Administrators, Atlantic City, N. J.

24–26, Land Improvement Contractors of America, Las Vegas, Nev.

25–28, American Camping Association, St. Louis, Mo. ♦

Roadside hay strips for pheasant nesting cover

A hayfield 68 miles long and only a few yards wide has been seeded in Ford County Soil and Water Conservation District, Ill., as part of an experiment in providing spring nesting places for pheasants.

The wildlife habitat planting project is being conducted by the Illinois Department of Conservation. It was initiated in response to concern about the effects of fall plowing and decreasing hay production on the pheasant population of east central Illinois. Field studies show that from 60 to 70 percent of the pheasant hatch comes from hayfields.

Someone with the Illinois Natural History Survey suggested that publicly owned roadside ditches be put into hay. As a result, roadbanks in a 16 square-mile area were seeded to an alfalfa-brome mixture.

Sixty-five farmers have agreed not to mow until August 1 each year. They will also exercise care when using herbicides along fence-rows or field ends.

The Natural History Survey will make comparative population counts. Similar roadside plantings have yielded up to three nests per acre in the past.

Funds for the project will be drawn from hunting license fees and a tax on hunter's ammunition.—STANLEY LANTZ, *farm editor, "Bloomington Pantagraph," Bloomington, Ill.*

A better environment for all people

Summary of activities of the Soil Conservation Service for fiscal year 1969

As we move into the seventies, an intensified drive for quality joins the concern for quantity in resource conservation and environmental management.

—Quality in the natural resource base to meet any foreseeable use or production needs.

—Quality in the environment for the use and enjoyment of all people.

—Quality in the living standard of rural families based on improved income.

—Quality in rural communities to provide attractive, convenient, and rewarding places to live and work.

Program activities are designed to complement and supplement each other in a total commitment to building harmony into the dynamic ecological system that is man's environment.

In the final year of the sixties, the Soil Conservation Service devoted an increasing share of available technical assistance to community resource development, erosion and sedimentation control, and other measures to bring about a cleaner, healthier, and more attractive environment for all people.

While continuing to give service to individual land owners and users at about the same level as previously, SCS in fiscal year 1969 greatly increased its assistance to local units of government and community organizations.

Local authorities increasingly looked to local conservation districts and the Soil Conservation Service to provide basic data on land and water resources for use in making decisions about land use and management at community, area, and regional levels.

In hundreds of communities, large and small, the Soil Conservation Service contributed substantially in dealing with agriculture-related pollutants of soil, water, and air and improving the esthetic aspects of land treatment and management.

Community service

In response to requests from planning officials and community leaders, SCS provided 51,301 planning and onsite technical services to 18, 191 governmental units or planning organizations during the year.

During 1969 SCS provided 4,187 resource inventories and evaluations to planning commissions or other agencies of local, state, or federal government. Such information included special soil survey reports and interpretations, water inventories, watershed data, conservation needs inventories, and information on conservation practices needed or applied.

Results of the information and counsel showed up in 568 communitywide, county, or regional resource plans, adopted by governing bodies, that included land use determinations made with SCS assistance.

In addition, 320 land use regulations, land-treatment control requirements, zoning ordinances, sanitary codes, building codes or standards, and the like, based on technical assistance or information provided by SCS, were issued or enacted by government bodies for public benefit.

SCS made field investigations and provided soil and water data and interpretations for site selection for 1,567 public facilities, such as schools, hospitals, sanitary landfills,

recreation areas, and sewer and water facilities.

Conservation districts

At the end of fiscal year 1969, 99 percent of the Nation's farms and ranches and 97 percent of private agricultural land were included in 3,017 conservation districts in the 50 states, Puerto Rico, and the Virgin Islands. All these districts are being assisted by SCS. They contain an approximate total area of more than 1.8 billion acres.

Seventeen new soil and water conservation districts were organized in fiscal year 1969. Consolidation of existing districts resulted in a net increase of five districts.

Assistance to individuals

At the same time, SCS conservationists and specialists performed 3¼ million technical services for about 1¼ million individual land owners and users in planning or implementing conservation measures, mainly through soil and water conservation districts.

SCS helped district cooperators prepare 80,829 new conservation plans and revise 37,960 existing plans in fiscal 1969. About 38 percent of the total operating units in the Nation, or about 1.7 million of them, have conservation plans covering 565.8 million acres. More than 701,000 cooperators established one or more needed conservation practices on their land as a result of SCS technical assistance. This added approximately 47 million acres to the land recorded as being adequately treated for its conservation needs. At the end of the year, 515 million acres or about 28 percent of the land in conservation districts was adequately treated.

Small farmers and minorities

The Soil Conservation Service continued assistance to small farmers (those usually grossing $10,000 or less annually) and rural residents living on small nonfarm tracts. Assistance to Negro and other minority groups in fiscal 1969 was consistent with the ratio of minority cooperators to white cooperators.

Group enterprises

Groups of land users solving conservation problems by developing group conservation and construction plans with SCS technical assisance rose 20 percent to 4,735, compared to 3,901 in 1968. More than 11,000 land users controlling almost 4 million acres were included in group conservation enterprises.

RC&D projects

Significant economic progress is being made in terms of employment and additional gross income being generated in 44 operational resource conservation and development project areas.

Measures completed at the end of fiscal year 1969 had provided more than 16,000 man-years of employment during installation and promised a like amount of continuing employment expected to result in $165 million in increased income annually.

SCS provided technical assistance, loans, and other financial help during the year for more than 5,000 measures with tangible community benefits. Other Federal departments, state agencies, and local groups rendered assistance in supporting and furthering project objectives.

SCS also provided assistance to local sponsors developing plans of action for seven other projects. Altogether, SCS worked with 51 RC&D projects totaling 173.5 million acres during the year. Another 51 applications, covering 159.1 million acres, were on hand at year's end awaiting authorization for planning assistance.

Great Plains Program

The Great Plains Program continues to apply, through long-term contractual arrangements, needed conservation treatment on entire farm and ranch units in 424 designated counties of the Great Plains region.

Priority is given where cropland unsuited for sustained cultivation is still being used for that purpose. Nearly 2 million acres of such cropland has been converted to grass since the program began. Roughly 21 percent of all the cropland in Great Plains Conservation Program contracts is planned for conversion.

In fiscal 1969, 3,484 farmers and ranchers placed 5.8 million acres under Great Plains Program contracts. Well over 34,000 farmers and ranchers now either have completed or have underway contracts for conservation treatment of more than 62 million acres.

A recent study of more than 4,000 contracts revealed that about 93 percent of them were maintaining sound conservation programs, or had made further improvements after contract expiration. Change of ownership accounted for most of the inadequate maintenance that existed.

Wind-erosion damage in the plains in the winter and spring of 1969 was the lowest recorded in 35 years of reports maintained by the Great Plains Agricultural Council and the Soil Conservation Service. A total of 995,150 acres was damaged in the 1969 "blow season," a decrease of more than 15 percent from the year before. In the drought years of the 1950's the acreage damaged by wind in a single season reached as high as 15.8 million acres. The decline is attributed in part to the increased use of soil and water conservation practices by Great Plains landowners.

Watershed projects

Watershed protection and flood prevention projects not only protect and develop the water and related land resources in upstream watersheds, but they also significantly enhance the economic development of surrounding areas.

More than half of the operating watershed projects is located in areas where low income prevails. By the end of fiscal 1969, construction and industrial expansion generated

by small watershed projects had created an estimated 50,700 jobs and added about $152 million to payrolls of previously unemployed or underemployed people.

Since the beginning of the program in 1954, watershed projects have prevented an estimated $142 million in property damages. Severe erosion has been curbed on 1.4 million acres and 11.5 million tons of sediment has been held out of streams and off bottom lands.

Estimates from each of the 50 states showed flood and sediment damages prevented during fiscal year 1969 by structural measures installed in the 50 pilot watersheds and 686 Public Law 566 projects totaled almost $40 million.

New reservoirs have provided municipal and industrial water supply for 260,000 people in 45 rural communities.

Planned recreation development for more than 250 reservoirs in 40 states will eventually support 12.5 million visitor-days of use annually. Last year, more than 12,000 acres of land and water habitat for wildlife was improved by reforestation and other conservation practices.

During the fiscal year federal assistance was furnished to sponsors of 732 approved projects. Initial agreements for construction were signed in 54 projects located in 33 states, bringing the total to 686 projects that have entered the construction stage. Sponsors of 33 projects completed the installation of all measures in 1969. A total of 238 projects have now been completed.

Local sponsors submitted 129 new applications for assistance under Public Law 566 during fiscal year 1969. Planning assistance was authorized for 100 projects, leaving a backlog of 1,284 unserviced applications at the end of the year.

A total of 103 projects were approved for operations. Another 32 plans were awaiting approval by Congressional committees at the year's end.

The multiple-purpose concept is strongly reflected in projects planned during fiscal year 1969. Of the 103 plans approved for operations, 66 or 64 percent included more than one purpose.

Pilot studies on the collection and automatic storage and retrieval of watershed data moved ahead in 1969. To date programs have been written and data assembled on magnetic tape identifying and describing all projects in operation through fiscal year 1968, plus some 600 individual reservoir-type structures.

River basin surveys

During fiscal year 1969, the Department carried on investigations in 59 river basins. Twenty-four of these are comprehensive interagency studies being coordinated by the Water Resources Council established under the Water Resources Planning Act of 1965, Public Law 80. Most of the other studies are carried on in cooperation with state water-resource agencies that require information on the agricultural, rural, and upstream watershed aspects of water and related land-resource development. Among the studies completed is the Water Resources Survey for the Appalachian Region.

The Soil Conservation Service has leadership for the Department's participation in these studies.

Soil surveys

The National Cooperative Soil Survey continues to provide maps and interpretations of soil information useful not only to farmers and ranchers but also to planners and builders in urbanizing areas and users of nonagricultural land.

Modern soil surveys suitable for operational planning now cover about one-third of the land needing them in the United States, including Puerto Rico and the Virgin Islands. About a third of these are published for general use in critically important areas. In fiscal year 1969, 43 survey areas, covering about 19 million acres, were published and 42 others, for more than 22 million acres, were sent forward for printing.

Detailed soil mapping was completed on 45.0 million acres and reconnaissance mapping on 3.8 million acres. In addition, special mapping for conservation planning was done on 7.8 million acres in areas where detailed surveys are not available.

The demand for general, or small-scale, soil maps also continues to grow. Such maps and their interpretations guide the more general and regional planning for large areas and counties. In many states such maps are prepared from existing data, including the reinterpretation of older published soil surveys that do not meet the full needs for operational planning. Several states have such maps for nearly all counties.

Urban planners and developers, engineering companies, and others increasingly use soil surveys in planning construction to take into account soils having severe limitations for houses, roads, and the like.

A start has been made on a new soil map of the United States at the scale of 1:1,000,000 which will be especially useful for planners concerned with multicounty and regional land use and resource problems. At this scale 13 large sheets will be required for the 48 conterminous states. Work is well along on the two easternmost sheets. Each map sheet will be accompanied by a comprehensive table setting forth important interpretations for all map units.

A new small-scale (1:7,500,000) map of the United States was printed by the U.S. Geological Survey as part of *The National Atlas*. It shows the distribution of soil orders, suborders, and great soil groups according to the new system of soil classification.

A soil map showing distribution of major kinds of soil in the world was drafted for publication at a scale of about 1:50,000,000.

The classification of soil series of the United States was nearly completed in a form that permits future handling by automatic data proc-

Summary of Progress, Fiscal Year 1969

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Progress items	Total reportable progress	Cumulative to June 30, 1969
Conservation plans and related services		
District cooperators ..... No.	98,087	2,193,102
" " ..... acres	37,081,508	749,414,343
Cooperators canceled ..... No.	65,534	—
" " ..... acres	21,052,816	—
Recipients of technical assistance ..... No.	1,180,703	—
Technical services ..... No.	3,207,094	—
Recipients applying practices ..... No.	701,623	—
Special mapping for planning and CNI ..... acres	7,798,216	233,737,484
Conservation plans prepared . No.	80,829	1,721,228
" " " acres	30,278,516	565,882,414
Conservation plans canceled . No.	50,070	—
" " " acres	15,920,198	—
Conservation plans revised . No.	37,960	—
" " " acres	23,069,039	—
Inventories and evaluations prepared ..... No.	17,072	—
Federal lands in coordinated conservation plans ..... No.	143	740
" " " acres	1,775,165	9,359,981
State and county CNI reports ..... No.	34	—
Resource planning and implementation		
Services on resource plans .. No.	51,301	—
Units of government assisted ..... No.	18,191	—
Resource plans prepared .... No.	568	—
Inventories and evaluations for resource plans ..... No.	4,187	—
Land use regulations established ..... No.	320	—
Site selection for public facility ..... No.	1,567	—
Operating units		
Total operating units ..... No.	8,330	4,553,987
" " " ..... acres	1,916,202	1,380,323,981
Miscellaneous land users .... No.	171,204	3,004,794
Resource planning units .... No.	25,002	73,477
Group conservation plans and services		
Group conservation plans ... No.	1,265	6,215
" " " .. acres	2,195,052	9,196,229
Group investigations ..... No.	4,136	49,747
" " ..... acres	4,376,897	41,534,757
Group construction plans ... No.	3,470	47,049
" " " .. acres	1,625,773	28,162,046
Groups assisted ..... No.	11,085	—
Services to groups ..... No.	74,221	—
Groups applying practices .. No.	2,829	—
Great Plains Conservation Program		
GP applications received ..... No.	3,879	40,004
" " " ... acres	7,374,796	75,940,028
GP contracts signed ..... No.	3,484	34,662
" " " ..... acres	5,817,564	62,240,420
GP contracts terminated:		
By mutual consent ..... No.	150	956
" " " ..... acres	123,663	1,400,075
For cause ..... No.	95	766
" " ..... acres	54,679	643,966
By expiration ..... No.	2,950	14,015
" " ..... acres	4,841,422	22,383,209
(Total terminations) ..... No.	(3,195)	(15,737)
" " ..... acres	(5,019,764)	(24,427,250)
Cropland before GP contract ..... acres	909,320	9,597,694
Planned cropland conversions ..... acres	156,752	1,974,011
Servicing other USDA programs		
Referrals serviced:		
ACP—F. Y. 1969 ..... No.	284,205	—
" —P. Y. 1968 ..... No.	—	299,251
Cropland Adjustment Program ..... No.	77	—
Cropland Conversion Program ..... No.	17	—
Appalachian Program ..... No.	1,338	—
Conservation plans approved . No.	2,732	—
Soil surveys		
Detailed soil surveys ..... acres	45,071,452	751,590,364
Reconnaissance ..... acres	3,768,750	24,754,559
(Total surveys) ..... acres	(48,840,202)	(776,344,923)
Soil conservation surveys .. acres	—	28,120,548
Soil conservation surveys canceled or converted ... acres	1,097,999	—
Snow surveys and water-supply forecasting		
Snow course measurements .. No.	6,294	—
Aerial snow marker readings ..... No.	1,003	—
Mountain precipitation gage readings ..... No.	1,726	—
Soil moisture station readings ..... No.	1,557	—
River stations for which numerical forecasts issued . No.	459	—
Numerical forecasts issued .. No.	1,972	—
Recreation developments		
Land owners and operators who have:		
Established their first commercial recreation enterprise .. No.	1,642	49,139
Expanded or added to commercial recreation enterprises . No.	764	—
Changed to recreation enterprises as their primary source of income ..... No.	240	8,743
" " " ..... acres	142,437	1,741,563
Private noncommercial recreation facilities established or expanded ..... No.	26,218	454,019
Public recreation facilities, established or expanded .. No.	544	27,861
Watershed and RC&D Project measures		
Floodwater structure sites investigated ..... No.	367	—
Channel sites investigated .. miles	425	—
Flood structures surveyed .. No.	475	—
Channels surveyed ..... miles	644	—
Floodwater structures designed ..... No.	406	—
Channels designed ..... miles	595	—
Services on land rights ..... No.	23,291	—
Floodwater structures under construction ..... No.	944	—
Channels under construction ..... miles	1,073	—

Summary of Progress, Fiscal Year 1969—Continued

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Conservation practices established	Total reportable progress	On the land June 30, 1969
Bedding ..... acres	25,468	585,718
Brush control ..... acres	4,332,867	41,279,696
Irrigation canal or lateral .. miles	225	43,479
Chiseling and subsoiling ... acres	761,503	5,707,656
Clearing and snagging .... miles	451	4,677
Conservation cropping system ..... acres	24,332,136	182,174,183
Contour farming ..... acres	3,837,962	45,654,610
Controlled burning ..... acres	368,114	4,160,231
Critical area planting ..... acres	123,740	6,094,954
Crop residue management .. acres	22,441,188	149,859,727
Dam, diversion ..... No.	514	23,400
Dam, multiple-purpose ..... No.	305	5,282
" " " .acre-feet	65,357	4,445,021
Debris basin ..... No.	1,393	81,128
Deferred grazing ..... acres	14,253,655	58,982,366
Dike and levee ..... miles	300	10,180
Irrigation ditch and canal lining ..... miles	1,414	25,722
Diversion ..... miles	2,370	96,719
Pond ..... No.	46,487	1,700,353
Farmstead and feedlot windbreak ..... acres	43,058	593,206
Field border planting .... miles	1,343	44,017
Irrigation field ditch ..... miles	2,047	124,368
Field windbreak ..... miles	3,950	90,303
Fish stream improvement .. miles	13	62
Fishpond management ..... No.	57,435	483,383
Floodwater diversion ..... feet	38,577	1,208,621
Floodwater retarding structure ..... No.	420	9,751
" " ...acre-feet	245,005	4,590,046
Floodway ..... miles	54	651
Grade stabilization structure ..... No.	10,483	194,752
Grassed waterway or outlet .acres	123,331	1,695,110
Hedgerow planting ..... miles	293	25,506
Hillside ditch ..... miles	190	5,079
Irrigation pipeline ..... miles	3,684	64,785
Irrigation storage reservoir ..... No.	507	39,625
" " " .acre-feet	29,631	8,313,378
Irrigation system, sprinkler ..... No.	3,999	113,445
Irrigation system, surface and subsurface ..... No.	5,327	131,836
Irrigation system, tailwater recovery ..... No.	807	10,308
Irrigation water management ..... acres	3,799,585	17,075,151
Drainage land grading .... acres	36,343	397,854
Irrigation land leveling .... acres	379,133	10,430,005
Land smoothing ..... acres	279,522	5,961,345
Minimum tillage ..... acres	1,788,742	15,808,044
Drainage main or lateral .. miles	6,414	326,354
Mulching ..... acres	73,961	583,783
Woodland site preparation .. acres	115,492	3,247,336
Pasture and hayland management ..... acres	10,886,031	48,799,623
Pasture and hayland planting ..... acres	3,112,253	62,531,867
Pipeline ..... miles	2,322	23,840
Proper grazing use ..... acres	72,157,778	227,831,966
Pumping plant for water control ..... No.	1,941	54,207
Grazing land mechanical treatment ..... acres	75,052	2,068,247
Range seeding ..... acres	485,780	13,344,072
Irrigation pit or regulating reservoir ..... No.	1,517	45,211
Range rotation—deferred grazing ..... acres	3,782,600	16,239,616
Access road ..... miles	1,174	9,507
Recreation area stabilization ..... acres	2,094	88,245
Recreation area improvement ..... acres	42,404	486,472
Recreation land grading and shaping ..... acres	12,125	176,956
Recreation trail and walkway ..... miles	387	4,777
Spring development ..... No.	4,734	112,368
Stock trail ..... miles	169	3,605
Streambank protection .... miles	464	6,839
Stream channel improvement ..... miles	1,016	14,431
Stream channel stabilization ..... miles	9	625
Stripcropping ..... acres	616,980	20,044,130
Structure for water control ..... No.	89,696	2,067,395
Drainage field ditch ..... miles	5,389	164,264
Terrace, basin ..... miles	71	2,709
Terrace, gradient ..... miles	11,184	763,933
Terrace, level ..... miles	9,515	383,070
Terrace, parallel ..... miles	7,551	63,064
(Total terraces) ..... miles	(28,321)	(1,212,776)
Tile drain ..... miles	23,408	745,081
Toxic salt reduction ..... acres	73,124	1,288,359
Tree planting ..... acres	321,636	17,676,752
Trough or tank ..... No.	12,572	398,707
Waterspreading ..... acres	20,528	1,037,253
Well ..... No.	7,966	447,778
Wildlife wetland management ..... acres	298,696	3,178,880
Wildlife habitat management ..... acres	4,069,626	16,350,125
Wildlife watering facility .... No.	1,354	12,449
Woodland direct seeding ... acres	15,487	571,179
Woodland improved harvesting ..... acres	1,430,277	25,903,069
Woodland improvement .... acres	553,659	13,168,605
Land treated		
Land adequately treated .. acres	47,030,354	515,763,985
Land use conversions[1]		
Cropland to grassland ..... acres	1,078,838	20,317,358
Cropland to woodland .... acres	59,700	2,298,122
Cropland to wildlife—recreation ..... acres	41,651	1,105,595
Cropland to "other" ..... acres	64,730	4,067,632
All other uses to cropland .. acres	199,406	6,129,369
All other uses (except cropland) to wildlife—recreation ..... acres	402,342	5,766,093

[1] Conversions on the land June 30, 1969, are estimates of conversion since July 1, 1962.

essing methods. A concept of a soil data system for the National Cooperative Soil Survey has been developed.

Snow surveys

As an aid to water users in the west, snow survey and water supply forecasting activity increased in 1969. SCS issued 459 river stage forecasts, about 10 percent more than in 1968. The number of snow-course measurements and snow marker, rain gage, and soil moisture readings that are the basis of the water forecasts increased similarly. The information is useful not only to individual farm irrigators but to people responsible for planning and operation of water storage and river flow control facilities.

Conservation Needs Inventory

Updating the National Inventory of Soil and Water Conservation Needs was virtually completed in 1969. One state report was published, and all are expected to be available in calendar year 1970. A national statistical report is also being prepared.

Land treatment

The establishment of conservation practices by land owners and users continued at about the same level as in the year before, with technical assistance being provided by SCS personnel assigned to local conservation districts.

Cropland

In the conservation treatment of croplands, farmers made notable progress in the improved management of crop residues, especially through minimum tillage practices. Conservation crop-residue management was reported on 22.4 million acres, an increase of 23 percent over the previous year. Minimum tillage was used on 1,788,742 acres of row crops, an increase of 15 percent. It is estimated that another 17 million acres of small grains were planted on land protected with stubble-mulch tillage. These practices do much to reduce runoff and erosion, thereby diminishing the amount of sediment in streams and dust in the air. At the same time, they reduce the labor and machinery costs of crop production.

Continued emphasis was placed on modern conservation systems to keep pace with new developments in farm equipment, materials, and methods. Use of parallel terraces, which are better adapted to the larger, faster, and more powerful farm equipment, continued to increase. Of the total terraces constructed, 27 percent were parallel this year compared to 23 percent last year.

The trend toward mechanization and automation of irrigation systems offers a means of further improvement in the effectiveness and efficiency of irrigation water management. Cooperating farmers increased the installation of surface and subsurface irrigation systems by 17 percent last year and installed a total of 10,133 irrigation systems of all types. SCS assisted cooperators in the application of irrigation water management according to conservation standards on 3.8 million acres.

On cropland requiring removal of excess water, landforming practices to prevent ponding and permit more timely farming operations continue to be one of the major improvements. Such land grading was completed on 36,343 acres in 1969, an increase of 4 percent. Most of the drainage improvements now being made are for upgrading existing systems on land previously drained. Additional benefits from reduction in mosquitoes result in improving living environment and diminishing the hazards of malaria and encephalitis.

Grazing land

On grazing land, proper grazing use, planned grazing systems, and fertilization were applied at an accelerated rate by cooperators in conservation districts. Proper grazing use was practiced on 72.1 million acres in 1969, and rotation deferred grazing was increased by 17 percent over the previous year to benefit 3.8 million acres. A total of 3.1 million acres of pasture and hayland seeding and 485,780 acres of rangeland seeding were established during the year.

Woodland

Woodland improvement in conservation districts made significant gains. Cooperators planted trees according to conservation plans on 321,636 acres and made direct woodland seedings on 15,487 acres. They planted 43,058 acres of farmstead and feedlot windbreaks and 3,950 miles of field windbreaks.

Today, more than ever before, woodlands are owned by people more interested in a place in the country for recreation, beauty, or just solitude than for the production and sale of wood crops. Within this setting, the Soil Conservation Service has adopted the concept that "Trees are for People," and is gearing an approach to include this type of owner.

Developing information about the adaptations of different kinds of soil to woodland use is a continuing effort of the Soil Conservation Service. During the fiscal year 1969, all available data were assembled, reviewed, coordinated, and recorded in a progress report by major land-resource areas. An automatic data processing system is being developed for the storage and retrieval of all soil-site information.

Wildlife land

Wildlife habitat management was instituted on more than 4 million acres, an increase of 27 percent over the previous year. In addition, wildlife wetland management was established on 298,696 acres.

Conservation plant materials

Eight new and improved conservation plants resulting from SCS plant materials work were cooperatively named and released in fiscal year 1969. They are: "Catalite" Boer lovegrass, "Lodorm" green needlegrass, "Tegmar" dwarf intermediate wheatgrass, "Pomar"

dwarf orchardgrass, "Barton" western wheatgrass, "Arnot" bristly locust, "Winnar" birdsfoot trefoil, and "Sonora" black grama.

The Soil Conservation Service over a several-year period has given plant materials assistance to the Department of Defense in an effort to stabilize blowing sand at Cam Ranh Bay base in Vietnam. SCS provided plant materials for test and, on the basis of successful trials, assisted the Department of Defense in locating commercial supplies of suitable seeds. More than 80 percent of the base is now stablized.

Outdoor recreation

Private land owners and operators, private and quasi-public clubs, groups, and organizations, and county and municipal governments established or expanded approximately 30,000 recreation developments during fiscal year 1969 with assistance by SCS.

More than 443,000 acres of land was converted to wildlife and recreation use in fiscal year 1969, an increase of about 29 percent over the preceding year. Recreation area improvement was accomplished on 42,404 acres compared to about 27,000 acres in 1968, an increase of more than 57 percent.

Appraisals of potentials for recreation development have been completed in 1,479 counties with 810 additional counties scheduled for completion by June 30, 1971.

International activities

During 1969 the Soil Conservation Service continued its cooperative program of assistance to developing countries in their efforts to make their lands more productive and alleviate hunger and poverty.

Technical aid was provided through a formal agreement between the U.S. Department of Agriculture and the Agency for International Development (AID). SCS provides assistance in three ways: (1) training foreign nationals in this country; (2) special projects in the developing countries under participating agency service agreements (PASA); and (3) technical consultation and support for AID personnel serving overseas.

At the end of the fiscal year, SCS was providing technical assistance in seven countries under PASA arrangements: India, Nigeria, Senegal, Thailand, Tunisia, Turkey, and Zambia. A total of 39 SCS employees were working in these countries on long-term assignments (2 years). During the year SCS also provided 11 people for short-term details (2–6 months) to six countries.

The SCS also provided training in this country for 424 visiting technicians and administrators from 49 countries. Of these 337 were sponsored by AID, 38 were sponsored by Food and Agriculture Organization of the United Nations, 39 were sponsored by miscellaneous foundations and organizations, and 10 traveled at their own expense. These people spent a total of 5,390 man-days in office and field with Soil Conservation Service personnel studying technical, managerial, and administrative aspects of conservation work. ♦

Teacher uses conservation films

A high school social science teacher who attended a conservation workshop at Grambling College in Louisiana in 1962 has since shown 365 conservation films to more than 2,100 students.

The workshop convinced her that conservation has a place in the high school curriculum. She returned for a repeat of the workshop in 1963 and 1964.

The teacher is Miss Ollie Cornist of Esther Toombs High School in Delhi, La.

The films on soil and water conservation, forestry, and wildlife conservation are supplied by the Soil Conservation Service, Louisiana Forestry Commission, and the Louisiana Wild Life and Fisheries Commission. In addition to films she uses slide talks, filmstrips, and other visuals supplied by SCS Area Conservationist D. L. Richardson in Tallulah.

When films are shown she follows them with a question and answer period. In some cases quizes are given to determine what the students learned. She also takes students on field tours to supplement films and other classroom studies. ♦

Sagebrush hill becomes a protected homesite

A sagebrush hill has been turned into 5 acres of beauty on the Paul Martin farmstead near Dove Creek, Colo.

Martin selected a homesite along Colorado State Highway 141 to take advantage of the beautiful sunsets and panoramic view of the Abajo (Blue) Mountains in Utah. He contacted the Dove Creek Soil Conservation District for assistance in planning a farmstead windbreak before constructing the farmhouse.

The SCS conservationist suggested a horseshoe type of planting to meet the needs of the Martin family. The farmhouse and other buildings would receive protection, and the Martins would have a panoramic view from their living room window.

The five-row windbreak consisted of caragana, Chinese elm, Rocky Mountain juniper, and ponderosa pine. In the opening of the horseshoe, Martin planted fruit trees. These add beauty to the farmstead as well as produce fruit.

Now that the trees are well established, Martin says he has often stepped out of the house and didn't know the wind was blowing until he got away from the protection of the windbreak—F. DALE HAMMER, *district conservationist, SCS, Dove Creek, Colo.* ♦

Part of Martin's windbreak.

Review

Can Primitive Farming Be Modernised. BY F. JURION AND J. HENRY. *1969. Institut National pour l'Etude Agronomique In Congo. Brussells, Belgium. 457 pp., illus.*

This is a translation from the French of a book summarizing the vast agricultural research program in the Congo (Kinshasa) over the past many years as applied directly to the improvement of farming. It gives information on the kinds of tropical soils, original vegetation, climate, crops, practices, and yields together with the effects of the systems on future productivity.

The examples include farming under different conditions ranging from areas of humid tropical rain forest with few rainless days to woodland and savannah with dry seasons up to 6 months.

This book is a must for those responsible for agricultural development on tropical soils used by people having little experience with science and modern technology.—CHARLES E. KELLOGG, *deputy administrator for Soil Survey, SCS.*

Food For Us All. The Yearbook of Agriculture *1969. USDA. 360 pp., illus.; plus color plates. $3.50.*

The national food story in its many aspects is the subject of another in the series of consumer-oriented Yearbooks of Agriculture.

Editor Jack Hayes in his preface describes the book as "a popular encyclopedia of food for the consumer in country or city."

" 'Food From Farm to You,' the first section of the Yearbook, describes the economics of food, from the farmer's field to the supermarket.

"The second section, 'Buying and Cooking Food,' is divided into the major food classes, from meat and poultry on to dairy products, fruits, vegetables, and — ultimately — pickles, spices, and herbs. Housewives may find the tips on buying and the recipes especially helpful.

"Nutrition and planning meals are major components of the third section of the Yearbook, 'Food and Your Life.' Some of the chapter subjects emphasize basic food needs, creating good food habits, and money-stretching ideas to make your food dollar go further."

As usual, the book is written by a wide variety of authors, mainly from the Department of Agriculture, other federal agencies, and state land-grant colleges.

New publications

Soil Conservation Service. *Rev. 1969. USDA PA 818. (8pp.) illus.; pocket size.* Briefly describes the work of the Soil Conservation Service.

Natural Resources of Oklahoma. *1969. U. S. Dept. Int. 54 pp., illus. $0.75.* The latest booklet in the Department of the Interior's series describing each of the states lays special stress on Oklahoma's unique Indian heritage. The capsule history of the settlement of Indian and Oklahoma Territories and the turbulent relations of white men and red in the emerging state is an effective introduction to the discussion of land and water resources today.

Booklets of this series present increasingly well-balanced treatments of the various resources and of the federal, state, and local programs for their management and conservation. In this one, the several agencies are named and described in alphabetical order without respect to their departmental affiliations.

Soil surveys

Schoharie County, New York. BY DONALD F. FLORA, J. A. FERWERDA, K. T. ACKERSON, J. B. BARTLETT, E. CROCKER, F. R. TROEH, J. C. DIJKERMAN, A. R. SOUTHARD, AND C. F. CASSADY. *1969. 53 pp., illus.; maps 4 inches to the mile (1:15,800).*

Gallatin County, Illinois. BY DONALD L. WALLACE AND J. B. FEHRENBACHER. *1969. 136 pp., illus.; maps 3.17 inches to the mile (1:20,000).* Fieldwork by Donald L. Wallace, F. L. Awalt, R. E. Bourland, F. N. Carroll, and L. M. Reinebach.

Perry County, Indiana. BY JOHN M. ROBBINS. *1969. 70 pp., illus.; maps 4 inches to the mile (1:15,800).* Fieldwork by Robert E. Modesitt, William J. Moriarity, Donald A. Cranor, William E. Couch, and John M. Robbins, Jr.

Vernon County, Wisconsin. BY ROBERT W. SLOTA. *1969. 82 pp., illus.; maps 4 inches to the mile (1:15,800).* Fieldwork by Robert E. Slota, W. W. Anderson, R. Church, G. D. Garvey, F. H. Haverland, H. Strelow, and others.

From the Administrator...

Ecology and economics

It is an interesting fact that two common words—*ecology and economics*—representing two major areas of concern to modern society were derived from the same origin. *Oikos* is a Greek word meaning household. Ecology literally means the *study* of the household. Economy literally means the *state* of the household.

Ecology has developed rather recently as the science that deals with the relations of living things to each other and to their environment. Economics is defined by Webster as the science that deals with the production, distribution, and consumption of wealth.

Our privately owned grazing resources cover more than 625 million acres. "That ain't hay"—hayland occupies another 78 million acres. Managing this major segment of our environment for the good of man requires the careful application of both ecological and economic principles.

The branches of applied ecology known as range management and agronomy plus economics are vital functions in the conservation and development of grazing lands. They are important elements in the technical competence of the Soil Conservation Service.

Grazing lands are complex in their combination of kinds of soils, climate, vegetation, animals, and the needs of people. They vary from complicated native plant communities on some rangelands to improved pastures consisting of stands of only one kind of plant. Each cooperator needs and uses a combination of the kinds of grazing land he can improve or develop with his own resources to meet his yearly needs. Properly developed and managed grazing lands are important for livestock forage, wildlife habitat, watershed management, and wide open spaces for pure enjoyment.

Last summer I made a 6-day trip to study our assistance to cooperators on grazing lands. We reviewed procedures for working with farmers and ranchers on grassland management. We visited with cooperators and observed the conservation programs they had applied. All were enthusiastic about the economic benefits of their conservation efforts.

Where ranchers had practiced proper grazing use and used planned grazing systems, plant cover showed noticeable improvement. Erosion and soil losses were reduced. We saw examples of healing gullies and reduced sheet erosion, even near ponds and wells where livestock concentrate.

Cooperators told me that technical assistance in grassland and livestock management practices was essential to them. They have found that without sound grazing management, practices such as brush control, seeding, stock-water developments, and fencing often are of marginal value.

The benefits to important wildlife species from conservation work were striking. We saw many deer, turkey, quail, and doves on the conservation ranches. Many cooperators are realizing substantial economic returns from wildlife.

I was most impressed of all by the obvious understanding ranchers had of range conservation principles when they had been properly assisted by our conservationists. This understanding was evident both in their comments and in the improvement of their rangeland. Unless we develop such understanding with cooperators, needed land treatment and management is not accomplished.

It is our responsibility to be competent in the physical, biological, and economic sciences and technologies applicable to grazing land so that we can assist cooperators to develop and manage them properly and profitably.

We can say that our objective is to encourage the management of grazing land resources for a satisfactory level of production and income in the short run while improving resources or protecting future options for their use in the long run.

The articles in this magazine together with our annual report of conservation accomplishments illustrate the application of these principles by district cooperators with SCS assistance.

Kenneth E. Grant

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District increases grass through Great Plains Program

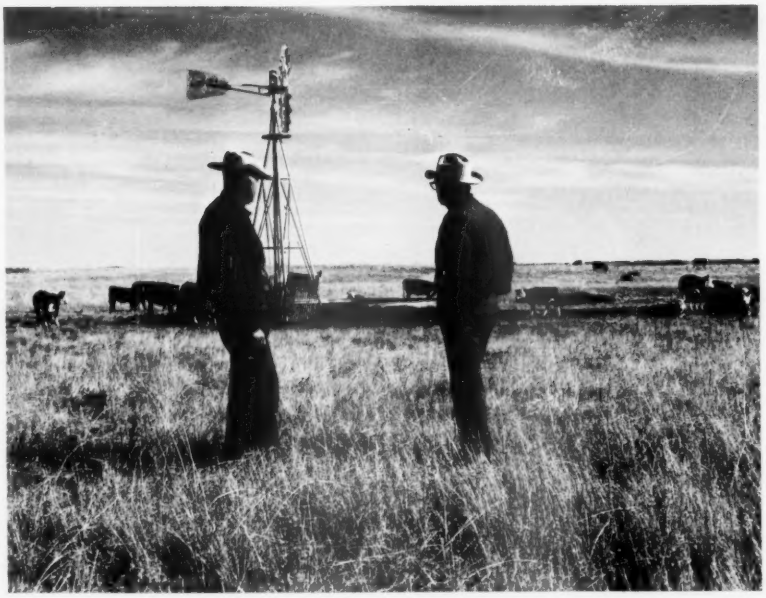
The Great Plains Conservation program has helped the ranchers of Todd County Conservation District of South Dakota convert some 4,700 acres of sandy textured cropland to grassland by cost-sharing for seed and seeding. SCS furnished technical assistance.

Seventy-three participants have signed contracts on farms and ranches ranging in size from 640 to more than 2,000 acres and covering a third of the district's area. Twenty-five of the contracts are with Indian land operators, with the Bureau of Indian Affairs and the Soil Conservation Service jointly assisting in planning and applying the conservation programs.

Much of the land in Todd County District is sandy textured. It erodes readily when left uncovered and exposed to the wind. Intensive cropping of these sandy soils has proved hazardous.

Nearly 3,000 acres has been converted to introduced pasture mixtures of intermediate and crested wheatgrass with alfalfa. The cool-season grasses lengthen the "green grass" grazing season and permit deferment of the native ranges composed mainly of warm-season grasses that begin growth in late spring.

Todd County Great Plains Program participants have interseeded 4,400 acres of low-producing "go-back" land with native grass mixtures. "Go-back" land is former cropland with low-producing plant cover persisting because of grazing pressure.



Owner Claude Lamoureaux, whose Great Plains contract was the first one prepared in the Todd County Conservation District, views with Feed Dealer Gene Hutchison a well and water-storage facility.

Through interseeding and proper management, 9,100 acres of rangeland in poor to fair condition is being restored to good and excellent condition and now provides grazing for around 600 more cattle. Proper grazing use has resulted in forage for another 1,500 head. Other management practices include 156 livestock watering facilities, 14,000 rods of fencing, and 250 acres of field, farmstead, and feedlot windbreaks.—GILBERT G. BIERWAGEN, *district conservationist, SCS, Mission, S. Dak.* ♦

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